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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,400	02/20/2002	Harry Meade	10275-041002	3033

31904 7590 09/19/2005

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EXAMINER	
WOITACH, JOSEPH T	
ART UNIT	PAPER NUMBER
1632	

DATE MAILED: 09/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/081,400	MEADE ET AL.	
	Examiner	Art Unit	
	Joseph T. Woitach	1632	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2005*.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *48-67* is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 January 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *See Continuation Sheet*.

Continuation of Attachment(s) 6). Other: copy of sequence listing and page 3 of spec.

DETAILED ACTION

This application filed February 20, 2002, is a divisional of 09/333,213 filed June 15, 1999, now US Patent 6,548,653, which claims benefit to 60/089,343 filed June 15, 1998.

Applicants' after final amendment filed August 8, 2005, has been received and entered. Claims 1-47 and 68 have been canceled. Claims 48-67 are pending.

Election/Restriction

Applicants elected group I, drawn to a erythropoietin serum albumin fusion protein without traverse. Claims 48-67 are pending and currently under examination.

Specification

Upon review of the specification and claims it is found that the nucleotide sequence disclosure contained in this application does not comply with the requirements for such a disclosure as set forth in 37 C.F.R. 1.821 - 1.825. Specifically, 37 CFR 1.821(d) states: "[w]here the description or claims of a patent application discuss a sequence that is set forth in the "Sequence Listing" in accordance with paragraph (c) of this section, reference must be made to the sequence by use of the sequence identifier, preceded by "SEQ ID NO:" in the text of the description of claims, even if the sequence is also embedded in the text or the description or claims of the patent application.

Two issues have been identified.

First, in the specification, page 3, line 9 for example, the formula (Ser-Ser-Ser-Ser-Gly)y has been identified with SEQ ID NO: 4, however the sequence listing provides the specific sequence set forth in line 9. A new listing with Ser-Ser-Ser-Ser-Gly should be provided. A copy of the sequence listing and the amended specification have been provided for Applicants' convenience.

The second related issue is the recitation of the sequences in the claims. As noted above, 37 CFR 1.821(d) that each recitation of a sequence be identified with a specific SEQ ID NO. In this case, the sequences of claims 61, 62, 64 and 67 should be amended to reflect the appropriate SEQ ID NO.

Appropriate correction is required.

For a complete response to this office action, applicant must submit all the required material for sequence compliance.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

The terminal disclaimer filed August 8, 2005 has bee received and entered. The terminal disclaimer has been accepted.

Claim Rejections - 35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims rejected under 35 U.S.C. 103(a) as being unpatentable over Bill *et al.* (BBA, 1995), Bill *et al.* (BBA, 1997), Korhonen *et al.* (European Journal of Biochemistry 245:482-489, April, 1997), and Syed *et al.* (all references listed in IDS) is withdrawn.

Cancellation of the claims subject to the rejection have obviated the basis of the rejection.

Conclusion

Claims 48-67 are allowed.

As noted previously, claims 48-67 are free of the art of record because while there is teaching and motivation to alter the various glycosylation sites in human EPO, there is no motivation to change each of the glycosylation sites, in particular because the art teaches that even single alterations can result an EPO protein with less activity than the non-modified form. While the art of record provides teachings and evidence that simple modifications to EPO can be made that result in a functional protein, the art of record fails to provide adequate motivation nor the expectation that one can successfully alter all the glycosylation sites of EPO. Further, while SA is added to provide greater stability when the fusion protein is present in the circulation of a subject, there would be no motivation to link an inactive form of EPO protein to SA for any purpose.

This application is in condition for allowance except for the following formal matters regarding sequence compliance as discussed above.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Woitach whose telephone number is (571) 272-0739.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla, can be reached at (571) 272-0735.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group analyst Dianiece Jacobs whose telephone number is (571) 272-0532.

Joseph T. Woitach

Joe Woitach
AU1632

<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetically generated linker sequence

<400> 4
Ser Ser Ser Ser Gly Ser Ser Ser Ser Gly Ser Ser Ser Ser Gly Ser
1 5 10 15
Pro

5 a.a
prt
artificial seq

5

Ser Ser Ser Ser Gly

acids in the peptide linker is selected from the group consisting of (Gly, Ser, Asn, Thr and Ala; the peptide linker includes a Gly-Ser element.

In a preferred embodiment, the fusion protein includes a peptide linker and the peptide linker includes a sequence having the formula (Ser-Gly-G1y-G1y-G1y)y (SEQ. ID 1) wherein y is 1, 2,3, 4, 5, 6,7, or 8. Preferably, the peptide linker includes a sequence having the formula $(Ser\text{-}Gly\text{-}Gly\text{-}Gly\text{-}Gly)_3$ (SEQ. ID 1). Preferably, the peptide linker includes a sequence having the formula ((Ser-Gly-Gly-Gly-Gly$[_3]_4$-Ser-Pro) (SEQ. ID 3).

In a preferred embodiment, the fusion protein includes a peptide linker and the peptide linker includes a sequence having the formula (Ser-Ser-Ser-Ser-Gly)y (SEQ. ID 4) wherein y is 1,2, 3, 4, 5,6, 7, or 8. Preferably, the peptide linker includes a sequence having the formula $((Ser\text{-}Ser\text{-}Ser\text{-}Ser\text{-}Gly)_3$-Ser-Pro) (SEQ. ID 4). = correct

when y=5

In another aspect, the invention features, an EPOa-hSA fusion protein wherein the EPOa includes amino acid residues G1n24, G1n38, G1n83 and A1a126.

In a preferred embodiment the EPOa is G1n24, 01n38, Gln83, A1a126 EPO (i.e., only amino acids 24, 38, 83, and 126 differ from wild type).

"SSSSG" should have seq id no

In another aspect, the invention features, an EPOa-hSA fusion protein which includes from left to right, an EPOa which includes amino acid residues G1n24, Gln38, G1n83 and Ala126, a peptide linker, e.g., a peptide linker having the formula ((Ser-Gly-Gly-GIy-Gly)$[_3]_4$-Ser-Pro) (SEQ. ID 3), and human serum albumin.

In a preferred embodiment the EPOa is G1n24, G1n38, G1n83, A1a126 EPO.

In a preferred embodiment the fusion protein is from left to right, G1n24, G1n38, Gln83, Ala126 EPO, a peptide linker having the formula ((Ser-Gly-Gly-Gly-Gly)$[_3]_4$-Ser-Pro) (SEQ. ID 3), and human serum albumin.

In another aspect, the invention features, an EPOa-hSA fusion protein which includes, from left to right, human serum albumin, a peptide linker, e.g., a peptide linker having the formula ((Ser-Gly-Gly-Gly-Gly)$[_3]_4$-Ser-Pro) (SEQ. ID 3), and an EPOa which includes amino acid residues G1n24, G1n38, G1n83 and Ala126.

In a preferred embodiment the EPOa is G1n24, G1n38, Gln83, Ala126 EPO.

In a preferred embodiment the fusion protein is from left to right, human serum albumin, a peptide linker having the formula ((Ser-Gly-G1y-GIy-Gly)$[_3]_4$-Ser-Pro) (SEQ. ID 3), and Gln24, Gln38, G1n83, A1a126 EPO.